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September 10, 1986

SEP 1986

BY FEDERAL EXPRESS

Ms. Susan E. Belski (3HW16)
Compliance Officer
U.S. EPA Region III
841 Chestnut Building
Philadelphia, PA 19107

RE: Limestone Road Site, Cumberland, Maryland

Dear Ms. Belski:

This will respond on behalf of Fairchild Industries, Inc. to the letter of Mr. Stephen R. Wassersug, dated August 11, 1986, accompanying the draft Remedial Investigation and Feasibility Study (RI/FS) and inviting comments thereon no later than September 12, 1986 (as per advice from your office).

We wish to call your attention to the fact that Fairchild has noted numerous detailed comments concerning the RI/FS but has limited the following response for the purpose of addressing the major endangerment issues as presented. In so doing, it was our purpose to restrict this commentary to those matters which directly impact on the proposed remedial action. However, during the course of further discussions of the RI/FS and the proposed remedial action, Fairchild may, as it deems necessary, address further comments in order to resolve any issue presented.

General Commentary

As a general commentary the RI/FS report for the Limestone Road site contains a number of assumptions and qualifications making it difficult to reach definitive affirmative conclusions as to site contamination and endangerment. What does emerge from the data as a whole is that the detected soil contamination on the site, both and inorganic, has minimal impact on surface and gro and, therefore, presents little or no endangerment to human exposure. Moreover, the possible influence or contribution by

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the City of Cumberland dump to overall contamination in the area raises significant questions as to source and responsibility which have not been addressed.

The report contains a number of statements concerning chromium and chromium sludge1/ but in the end the data does not support a conclusion that chromium plays any significant role in environmental endangerment at the site. In this connection, we believe it important to note that the Background statement in the RI (p. 1) that 110 tons of chromium sludge was dumped on the site is not substantiated. Indeed, a further statement that 99 tons were dumped on the CC&SC property and 11 tons on the Diggs property is completely groundless. In addition, while the report makes an assumption that chromium in the soil is in the hexavalent form it is conceded this may be incorrect (RI, pp. 6-33 to 6-34) and that soil chromium is expected to be found primarily in the immobile trivalent form (RI, p. 6-37). Accordingly, it seems only fair that the report contain a statement that there is little or no endangerment from the Fairchild sludge at the site.2/

Based on the data in the RI, it is easily understood why the FS makes no selection as to a specific remedial alternative. Perhaps the unresolved issue of the City Dump is partly responsible for this but we believe it more likely that under the circumstances where little or no real endangerment could be concluded it was perhaps more judicious for the EPA contractor to review the range of possible alternatives within all five of the guidelines of the National Contingency Plan (NCP) for ultimate selection by Region III and/or the responsible parties. We have, therefore, carefully reviewed with the aid of competent consultants all of the data presented in the RI to pinpoint the real problem areas and attendant risks and will address these for pertinent remediation which is both cost-effective and consistent with the application of the NCP.

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1. This is perhaps because of the reported event (by the State of Maryland) of illegal dumping of chromium sludge from Fairchild Industries' Hagerstown, Maryland, plant in 1981 which triggered the listing of the site on the National Priorities List.

2. It must be recalled that at the time, 1981 and 1982, there were many reports in the local news media concerning Diggs' illegal dumping of Fairchild sludge raising citize[illegal] that this was the primary and perhaps only hazard at the site.

If remedial measures are to be undertaken at the site, then additional efforts to identify potentially responsible parties need to be undertaken. The FS states that the Diggs property was part of the city dump for many years. (FS, p. 5-14) Therefore, it appears that the City of Cumberland may be a responsible party in connection with the Limestone Road site. In addition, potential sources of organic contaminants have not been identified. Materials in EPA's files on other PRP's suggest that these parties may have generated solvents and waste oils disposed of on the site. Other wastes possibly sent to the site (e.g., glass manufacturing wastes) should be further analyzed to determine whether they are sources of contamination at the site.

1. Adequacy of Investigation

Questions exist as to the adequacy of the site investigation. The vast majority of the soil samples analyzed were taken from subsurface material. On the other hand, all background soil samples were collected from the top ten inches of soil. (see RI, pp. 3-6 to 3-8) In explaining the differences between soil and shale with regard to concentrations of certain ions, the RI states that the ions may have been leached from the soil into the groundwater and surface waters. (RI, p. 4-11) Therefore, the background surface soil samples may not be comparable to the on-site subsurface soil samples. It should also be noted that a chemical analysis of on-site shale seems appropriate in order to properly interpret the sampling results.

There is serious concern about the adequacy of the hydrogeologic investigation. The RI states that groundwater movement in the shales appears to be dominated by fractured flow. (RI, p. 4-4) The primary fractures are perpendicular to the observed groundwater gradients based on head measurements. (RI, pp. 4-3 to 4-4, 4-8). Although a possible secondary fracture set may allow flow along the same direction as the gradient, it is not clear that the generalized groundwater flow map (RI, Figure 4-5) represents the most probable characterization of groundwater flow. In fact, the hydrogeologic investigation indicates localized groundwater flow different from the regional flow. (See Attachment A, Assessment of Hydrogeologic Findings by Dr. Paul Grosser, H2M)

2. Endangerment Issues

The major endangerment issues at the site relate to on-site soil and groundwater. (FS, p. 2-5) In order for a risk of an adverse effect from a contaminant to exist, there must be: (1) a source of the chemical; (2) a release of the chemical from the source; (3) a receptor for the release of the contaminant; (4) transport of the contaminants from the source to a receptor; and (5) exposure of the receptor at a level sufficient to produce an adverse effect. (RI, p. 6-3)

A. Soil

The remedial objectives for soil contamination are to control migration to groundwater, to control migration to surface water, and to minimize direct contact. (FS, pp. 2-6 to 2-7) The major organic contaminants of concern in soil are benzo(a)pyrene and polychlorinated biphenyls (PCB's). (see FS, Table 1) Polycyclic aromatic hydrocarbons such as benzo(a)pyrene have low solubilities and high soil-water partition coefficients, indicating a tendency to migrate very slowly. (RI, p. 5-6) Biodegradation of benzo(a)pyrene is also possible. (RI, Table 5-2). PCB's have been found at the site at "trace" concentrations only. (FS, Table 6-2) PCB's readily adsorb to soil and have very low solubilities, and thus migrate slowly. (RI, pp. 5-7 to 5-8) In addition, the PCB Aroclor 1242 is biodegradable. In conclusion, the major organic contaminants are unlikely to migrate from the site through groundwater.

The major inorganics of concern at the site are barium, cadmium, chromium, copper, lead, manganese, nickel, selenium and zinc. (FS, Table 1) The RI reviewed the environmental behavior of the "indicator" contaminants barium, cadmium, chromium, lead, nickel and zinc, and concluded that sorption had a significant effect on the migration of each of these metals. (see RI, Table 5-2) Therefore, concern regarding migration of these constituents should be minimal.

"[I]n the soil, chromium may be expected to be found predominantly in the trivalent form because of the presence of reducing organics." (RI, p. 6-33) As stated above, trivalent chromium is immobile. The groundwater sampling results, in which chromium was not detected at concentrations considered threatening to human health (RI, p. 4-25), support this conclusion.

Future exposure to predominantly subsurface soils would most likely occur if excavation or extensive erosion were to take place. (RI, p. 6-7) The prospect of excavation can be controlled with deed restrictions. The current "extensive" vegetative cover should minimize the risks of erosion. (RI, pp. 6-10 to 6-11). Fencing would also minimize direct contact with contaminated soil and allow for further growth of vegetation.

B. Groundwater

The remedial objectives for groundwater are to control migration of contaminants to groundwater and surface water and to minimize direct contaminant consumption. As stated above, the on-site soil contaminants will tend to adsorb to soil. So long as the risks of excavation and erosion are minimized, the risks of migration of contaminants to groundwater and surface water will have been adequately addressed.

The FS identifies five inorganic contaminants of concern in groundwater: cadmium, lead, manganese, nickel and zinc. (FS, Table 1) Nickel exceeded EPA's acceptable daily intake level in one sample from each of two drinking water wells. (FS, Table 2-3; RI, Figures 4-14 to 4-17) "Of all the toxic metals, only nickel appears to exhibit a trend even though a specific plume cannot be identified." (RI, p. 4-23) The report was unable to conclusively determine which filled areas might be contributing. (RI, pp. 4-24, 6-22) The report notes that a sample indicative of the leachate being generated by the city dump had a significant concentration of nickel. (RI, p. 4-24) Nickel could also be from local geological materials native to the site in contact with the groundwater. (RI, p. 6-22) The Fairchild chromium sludge did not contain nickel.

The RI notes that the concentrations of zinc in residential wells generally exceed the concentrations observed in monitoring wells by one or two orders of magnitude. (RI, p. 4-14) Zinc concentrations exceeded acceptable daily intake levels only in residential wells. (FS, Table 2-3; RI, Figures 4-14 to 4-17) No zinc plume was identified in the analytical data. (RI, p. 4-14) Therefore, it is likely that the zinc in these wells is attributable to a source other than the landfill area. The RI identifies naturally occurring high zinc concentrations and galvanized piping or tanks as among the plausible explanations for the high zinc concentrati residential wells. (RI, pp. 4-14 to 4-15)

Lead in groundwater (as well as zinc) may have originated from contact of the water with old or corroded piping or solder, but the presence of galvanized piping or water tanks in the residential wells was not investigated. (RI, pp. 4-14 to 4-15, 6-22, 6-32) Lead was detected in only one monitoring well sample. (RI, Figures 4-14 to 4-16). None of the drinking water well samples exceeded the maximum contaminant limit for cadmium. (FS, Table 2-3; RI, Figure 4-17) The toxic inorganic constituents cadmium and lead "appear sporadically in both monitoring and residential wells but show no consistent spatial or temporal distribution." (RI, p. 4-24) There is no consistent correlation between monitoring wells, residential wells and groundwater flow paths to conclusively support the contention that these constituents are migrating from landfilled areas. (RI, p. 4-25)

The RI states that the "analytical data do not indicate a discernible trend relating high concentrations of manganese in residential wells to landfilling operations." (RI, p. 4-15) The manganese levels are most likely from naturally occurring geological materials at the site.

Elevated levels of cadmium, lead, nickel and zinc were found in soil samples taken from the Cumberland City Dump (RI, Figure 4-9), suggesting this site as a possible source of inorganics in groundwater. Furthermore, cadmium, lead, manganese, nickel and zinc in sediments were found in their highest concentrations at location SD005, which receives a large portion of its contaminant input from the City Dump. (RI, p. 6-36) The sole observations above background for manganese, nickel and zinc were at this location. (FS, Table 1)

Despite the relatively high concentrations of chromium on the Diggs and the CC&SC properties, chromium has not been detected in groundwater at concentrations considered threatening to human health. (RI, p. 4-25) These results support the conclusion that the chromium is immobile. In conclusion, the levels of inorganics in drinking water rarely exceeded the applicable standards. The mineralized groundwater in the area of the site makes it difficult to draw any conclusions regarding degradation attributable to landfill areas.

C. Surface Water and Sediment

The FS concludes that the endangerment from surface water contamination is minor since ingestion of surf[illegible] would be extremely unlikely and since aquatic toxici[illegible] considered applicable to the surface water in either the CC&SC or the Diggs property drainage streams (although it is considered applicable to the North Branch of the Potomac River). (FS, Table 1, pp. 2-3 to 2-4)

The remedial objective for sediment is to minimize direct contact. (FS, pp. 2-11 to 2-12) The sources of stream sediments are precipitation from surface water and erosion of soils. If the surface water is not considered a contamination problem, then the primary risk relates to erosion. Potential erosion risks are adequately dealt with by fencing and deed restrictions.

Proposed Remedial Action

Fairchild proposes that remedial action at the Limestone Road site to be accomplished include:

* Deed restrictions and fencing of refuse areas of Diggs and CC&SC properties.

* Limited monitoring of surface water.

* Extension of city water supply to local residences.

Based on the endangerment and risk assessments in the RI report, we conclude that a limited remedial action above outlined sufficiently addresses the real environmental concerns at the Limestone Road site. As already stated in these comments, these areas of concern are the contaminants in the soil and the possible effect of same on the groundwater. Possible endangerment is limited to human exposure to both media principally through direct contact with soil and drinking water consumption.

We agree with the FS analysis that this type of response -- fencing and deed restrictions of the refuse-filled area -- would reduce the likelihood of direct soil contact and casual site access. (FS, pp. 6-10 to 6-11, 6-22 to 6-23). It is also significant that since the site has been closed to dumping operations since 1981 most of the affected area is now covered with vegetation. Restricted site access would allow the vegetation to increase thereby naturally reducing possible soil erosion. Periodic monitoring of the surface water fro leachate seeps discharging from the base of the waste masses on both the Diggs and CC&SC properties for a limited period of time (annually for five years) should be sufficient to detect any trend of contamination of these environmental media.

While we had earlier investigated the feasibility of a limited clay/soil cover over the soil contaminated areas, we believe in view of the RI/FS findings and analysis that such an alternative is inappropriate and not cost effective. The two objectives cited for this remedial alternative are reduction of water infiltration that may transport contaminants to groundwater and reduction of contact with soil. Once the affected areas are properly fenced the objective of reducing soil contact by covering is redundant. In addition, it is conceded in the (FS, p. 5-13) that the selective "cap" for the CC&SC property would address less than 5% of the total volume of water that moves over and through the refuse fill. It is also concluded that the effectiveness of similar capping of the Diggs property "cannot be estimated" (FS, p. 5-15) and that "correlation of contaminant release reduction with capping system is not possible for the soil and refuse matrix at Diggs." Finally, as stated earlier, the fact that soil contamination on both properties has minimal impact on groundwater strongly suggests that any concern regarding transport of contaminants to groundwater through infiltration is insufficient to warrant the expensive cover alternative.

Fairchild also believes that the groundwater quality in the vicinity of the site, including the City Dump, may have been influenced by natural background condition as well as possible effects of landfilling operations that have taken place since 1962 when operations at the City Dump commenced. Accordingly, Fairchild recommends that modifications be made to the drinking water supplies of local residences which would constitute a response to the natural progression of development in the area. It is expected the City of Cumberland will provide the resources needed for connecting the municipal water supply to these residences.

Once you have reviewed these comments and recommendations, we would welcome the opportunity to answer any questions. We also believe it would be most fruitful to more fully discuss the technical aspects of the RI/FS report and these comments in detail toward the end of achieving agreement on a proper and cost effective remediation.

Very truly yours,

Richard R. Molleur

Attachment

ATTACHMENT "A"

CONCLUSIONS

Regional groundwater flow, as traditionally based upon hydraulic gradient, is in the northwest direction for this area. Flow direction is further complicated by the geology of the area (i.e., fractured shale and structural elements). Further analysis of historical and possibly additional field data is needed to understand these flow patterns, especially in local areas.

Local flow patterns may render a clearer picture of actual flow. This is evidenced by the CC&SC site where it is seen that steep gradients demonstrate flow toward and discharging to an unnamed tributary. At this site localized flow is towards the southwest as opposed to regional flow to the northwest.

It is also unclear whether water percolated through the waste mass on the CC&SC property will if at all reach the water table. At this point in time, the well data directly downgradient and beneath this location indicates that it will not.

INTRODUCTION

Comments are included herein on the hydrogeologic investigation of the Remedial Investigation (RI) Report for the Limestone Road Superfund Site, Cumberland, Maryland. The probable regional groundwater flow patterns and localized groundwater flow patterns near the Cumberland Cement & Supply Co. (CC&SC) are discussed.

REGIONAL GROUNDWATER FLOW

The RI Report has obtained a voluminous amount of field and historical data to support their interpretation of the regional groundwater flow. However, these flow patterns are not clear-cut in a fractured shale media.

Regional flow is typically based on the hydraulic gradient which would be to the northwest at this site. At this particular site the flow direction is complicated by the existing subsurface (structural) geology and fracture patterns of the shale. The latter items have probably more influence on groundwater flow and need to be analyzed further. Another key (and controversial) issue at this site is the anisotropic nature of the aquifer.

Structurally, the strike trends to the southwest-northeast and the dip averages about 70° from the horizontal. This indicates that the groundwater flow is perpendicular to the general strike, which is unreasonable. Primary fracture patterns as exhibited in Figure 4-4 of the RI Report also parallel strike, but possible secondary fractures are perpendicular to strike.

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The structural elements just discussed require further analysis to define vertical and horizontal flow patterns in groundwater. The State of Maryland made some pertinent comments regarding this. Data is needed to understand the regional as well as localized flow patterns, possible recharge points, and artesian conditions. Presumably, Maryland has ready access to such geologic information (historical data) and would be useful to obtain.

Finally, a comment on treating fractured shale as porous media. The consultant in the report is clearly aware of the anisotropic and heterogeneous nature of the flow. The method used was discussed in Appendix C (Snow's method employs anisotropy for flow). Also, Freeze and Cherry claim it is a common approach in field investigations to mathematically treat contaminant migration in fractured media as porous media of an isotropic and homogeneous nature.

PROBABLE LOCAL GROUNDWATER FLOW PATTERNS AT THE CC&SC SITE

The regional flow, as stated earlier due to change in water level, is to the northwest. However, at the CC&SC site, local groundwater flows from upland areas and discharges to the intermediate stream just southwest of the site as indicated by the groundwater contours (see Schematic Figure A'. It is assumed that the major fracture patterns as depicted in Figure 4-4 of the RI Report do not influence the flow in this local area.

Infiltration occurs via precipitation into the more permeable fill at the dump site. The fill is overlying fractured shale of lower permeability. The flow proceeds vertically to the groundwater and is discharged to the stream (see Schematic Figure B). Evidence of artesian conditions at Well MW-12 (see RI Report p. 4-5) indicates discharge which is probably due to topographic control.

This dump area is a ravine surrounded by steep gradients. Natural runoff can occur from the north (City Dump) and to the southwest as well as from the CC&SC site directly affecting the stream. Interflow in the thin permeable soil layer is a small contribution in addition to runoff since erosion occurs on the steep slopes.

The fractures of Figure 4-4 of the RI Report indicate secondary (possible) fractures near the stream and a principal fracture set just northeast of the CC&SC site. Remote sensing data for this local site would aid in locating local lineaments and surface fracture traces. It is assumed that aerial photographs were used to locate the fractures in Figure 4-4.

In regard to structure, strike of the beds is north-northeast to south-southwest. Localized flow indicates compliance with strike. It is assumed that the angle of dip is approximately 70°.